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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,395	03/25/2004	Mutsumi Yano	50024-028	5556
7590	03/25/2005		EXAMINER	
McDERMOTT, WILL & EMERY 600 13th Street, N.W. Washington, DC 20005-3096			THOMAS, ERIC W	
			ART UNIT	PAPER NUMBER
			2831	

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/808,395

Applicant(s)

YANO ET AL.

Examiner

Eric W. Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 10-16 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7 and 10 is/are allowed.
- 6) ☒ Claim(s) 1-3, 15-16 is/are rejected.
- 7) ☒ Claim(s) 4-6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

INTRODUCTION

The examiner acknowledges, as recommended in the MPEP, the applicant's submission of the amendment dated 12/27/04. At this point, claims 1, 7 have been amended; claims 8-9 have been cancelled; claims 11-14 are withdrawn from consideration; and claims 15-16 have been added. Thus claims 1-7, 10, 15-16 are pending in the instant application.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Yoshida et al. (US 6,215,652).

FIG. 6

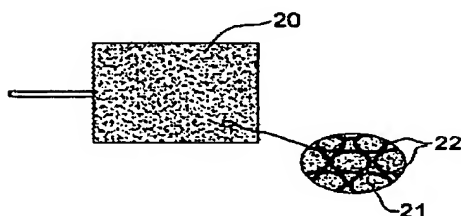
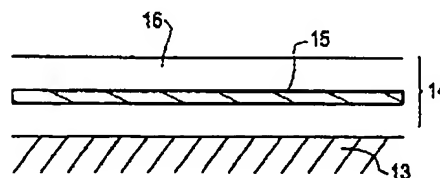


FIG. 4



Yoshida et al. disclose in fig. 4, 6, a solid electrolytic capacitor comprising a substrate (13, 21) composed of a porous sinter of niobium particles; a niobium nitride layer (15, 22) formed on the surface of the said niobium particles; and a dielectric layer composed of niobium oxide (upper portion --16) formed on the surface of said niobium nitride layer.

3. Claims 1-3, 15-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Yuan (US 2005/0024810).

Yuan discloses a solid electrolytic capacitor comprising a substrate (valve metal sintered body) composed of a porous sinter of niobium particles; a niobium nitride layer formed on the surface of the niobium particles; and a dielectric layer composed of niobium oxide formed on the surface of the niobium nitride layer.

Regarding claim 2, Yuan discloses the substrate and the niobium nitride layer constitute an anode.

Regarding claim 3, Yuan discloses the dielectric layer is nitrogen-free (formed from an oxide material).

Regarding claim 15, Yuan discloses a solid electrolytic capacitor comprising an anode including a substrate composed of niobium and an niobium nitride layer formed on the surface of the substrate; and a dielectric composed of niobium oxide formed on the surface of the niobium nitride layer.

Regarding claim 16, Yuan discloses a substrate composed of niobium; a niobium nitride layer formed to solidly cover the surface of the substrate without

producing any clearance; and a dielectric layer composed of niobium oxide formed on the surface of the niobium nitride layer.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda et al. (US 6,400,556) in view of Shimada et al. (US 6,473,293) and Tripp et al.

Masuda et al. disclose in fig. 2, a solid electrolytic capacitor comprising an anode including a substrate (2 – see also example 1) composed of a valve metal material, and a sintered layer (3) composed of a valve metal material, and a dielectric composed of an oxide formed on the surface of sintered valve metal.

Masuda et al. disclose the claimed invention except for the valve metal foil is formed from a niobium, the sintered valve metal is formed from a niobium nitride, and the dielectric layer is composed of niobium oxide.

Shimada et al. teach that it is common in the solid electrolytic capacitor art to form a valve metal foil from a niobium metal foil (see col. 5 lines 50-55). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form the valve metal foil of Masuda et al. using the known niobium metal foil as taught by Shimada et al, since such a modification would provide a valve metal for the capacitor of Masuda et al. Niobium has always been an alternative to tantalum because of its adequate chemical properties and its greater availability.

Tripp et al. teach that sintered niobium nitride is a known valve metal used in the solid electrolytic capacitor art wherein a niobium oxide is formed as a dielectric material directly of said niobium nitride. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form the capacitor of Masuda et al. (the sintered valve metal & dielectric oxide) having a sintered member formed from niobium nitride and the dielectric oxide from niobium oxide, since such a modification would provide a valve metal sintered material being stable, and reliable for the capacitor of Masuda et al, wherein the material has relatively low bias dependence of capacitance. The interface between the niobium nitride and niobium oxide is thermodynamically stable. The niobium oxide has a dielectric constant higher than tantalum oxide.

Regarding claim 16, Masuda et al. disclose in fig. 2, (and example 1) a substrate (2 – see also example 1), composed of a valve metal; a sintered valve metal (3) solidly

cover the surface of the substrate without producing any clearance (note example 1 and fig. 1-2); and a dielectric formed on the surface of the sintered valve metal.

Masuda et al. disclose the claimed invention except for the valve metal foil is formed from a niobium, the sintered valve metal is formed from a niobium nitride, and the dielectric layer is composed of niobium oxide.

Shimada et al. teach that it is common in the solid electrolytic capacitor art to form a valve metal foil from a niobium metal foil (see col. 5 lines 50-55). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form the valve metal foil of Masuda et al. using the known niobium metal foil as taught by Shimada et al, since such a modification would provide a valve metal for the capacitor of Masuda et al. Niobium has always been an alternative to tantalum because of its adequate chemical properties and its greater availability.

Tripp et al. teach that sintered niobium nitride is a known valve metal used in the solid electrolytic capacitor art wherein a niobium oxide is formed as a dielectric material directly of said niobium nitride. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form the capacitor of Masuda et al. (the sintered valve metal & dielectric oxide) having a sintered member formed from niobium nitride and the dielectric oxide from niobium oxide, since such a modification would provide a valve metal sintered material being stable, and reliable for the capacitor of Masuda et al, wherein the material has relatively low bias dependence of capacitance. The interface between the niobium nitride and niobium oxide is thermodynamically

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stable. It also should be noted that niobium oxide has a higher dielectric^{constant} than tantalum oxide

-ET3/10/05

Allowable Subject Matter

7. Claims 7, and 10 are allowed.

8. Claims 4-6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach or fairly suggest (taken in combination with the other claimed features) the niobium nitride layer is Nb₂N (claim 4); the nitrogen content based on the total weight of said substrate, said niobium nitride, and said dielectric layer is not less than 0.001 % by weight nor more than 0.2 % by weight (claim 5); the nitrogen content based on the total weight of said substrate, said niobium nitride, and said dielectric layer is not less than 0.001 % by weight nor more than 0.08 % by weight (claim 6); the niobium nitrides composed of NbN_x where said x is not less than 0.05 nor more than 0.75 (claims 7, 10).

Response to Arguments

10. Applicant's arguments with respect to claims 1-3, have been considered but are moot in view of the new ground(s) of rejection.

11. Applicant's arguments, see page 5, filed 12/27/04, with respect to claims 7, 10 have been fully considered and are persuasive. The rejection of claims 7 and 10 has been withdrawn.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric W. Thomas whose telephone number is 571-272-1985. The examiner can normally be reached on Monday - Friday 5:30 AM - 2:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eric W Thomas
Primary Examiner
Art Unit 2831

ewt


ERIC W. THOMAS
PRIMARY EXAMINER

3/18/05